CLAIMS

What is claimed is:

1. An optical device, comprising:

a collimator;

at least one anamorphic pair of prisms optically coupled to the collimator;

a diffraction grating optically coupled to the at least one anamorphic pair of prisms at a side opposite to the collimator; and

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a focusing lens optically coupled to the diffraction grating.

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2. The device of claim 1, wherein the optical device is a demultiplexing device, wherein the collimator is optically coupled at a side opposite to the at least one anamorphic pair of prisms to an input device for providing a multi-channel light, and wherein the focusing lens is optically coupled at a side opposite to the diffraction grating to at least one output device for receiving at least one channel of the multi-channel light.

3. The device of claim 2, wherein the multi-channel light comprises a circular cross-section.

4. The device of claim 3, wherein the multi-channel light is converted by the at least one anamorphic pair of prisms such that the multi-channel light comprises an anamorphic cross-section.

5. The device of claim 1, wherein the optical device is a multiplexing device, wherein the focusing lens is optically coupled at a side opposite to the diffraction grating to at least one input device for providing a plurality of channels, and wherein the collimator is optically coupled at a side opposite to the at least one anamorphic pair of prisms to an output device for receiving a multi-channel light, wherein the multi-channel light comprises the plurality of channels.

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6. The device of claim 5, wherein the plurality of channels each comprises an anamorphic cross-section.

7. The device of claim 6, wherein the multi-channel light is converted by the at least one anamorphic pair of prisms such that the multi-channel light comprises a circular cross-section.

8. The device of claim 1, further comprising:

a micro-mirror array optically coupled to the focusing lens at a side opposite to the diffraction grating, wherein each mirror in the array reflects at least one channel of a multi-channel light at a particular angle, wherein a tilt of each mirror in the array may be adjusted independently of the other mirrors in the array.

9. The device of claim 8, wherein the optical device is a demultiplexing device, wherein the collimator is optically coupled at a side opposite to the at least one anamorphic pair

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of prisms to an input device for providing a multi-channel light and to at least one output device for receiving at least one channel of the multi-channel light.

10. The device of claim 9, wherein the multi-channel light comprises a circular cross-section.

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11. The device of claim 10, wherein the multi-channel light is converted by the at least one anamorphic pair of prisms such that the multi-channel light comprises an anamorphic cross-section.

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12. The device of claim 8, wherein the optical device is a multiplexing device, wherein the collimator is optically coupled at a side opposite to the at least one anamorphic pair of prisms to at least one input device for providing a plurality of channels and to an output device for receiving a multi-channel light, wherein the multi-channel light comprises the plurality of channels.

13. The device of claim 12, wherein the plurality of channels each comprises a circular cross-section.

14. The device of claim 13, wherein each of the plurality of channels is converted by the at least one anamorphic pair of prisms such that the plurality of channels each comprises an anamorphic cross-section.

15. A system, comprising:

an input device for providing a multi-channel light;

an optical device, comprising:

a collimator optically coupled to the input device,

at least one anamorphic pair of prisms optically coupled to the collimator at a side opposite to the input device,

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a diffraction grating optically coupled to the at least one anamorphic pair of prisms at a side opposite to the collimator, and

a focusing lens optically coupled to the diffraction grating; and

at least one output device optically coupled to the focusing lens at a side opposite to the diffraction grating for receiving at least one channel of the multi-channel light.

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16. The system of claim 15, wherein the multi-channel light comprises a circular cross-section.

17. The system of claim 16, wherein the multi-channel light is converted by the at least one anamorphic pair of prisms such that the multi-channel light comprises an anamorphic cross-section.

18. A system, comprising:

at least one input device for providing a plurality of channels;

an optical device, comprising:

a focusing lens optically coupled to the at least one input device,

a diffraction grating optically coupled to the focusing lens at a side opposite to the at least one input device,

at least one anamorphic pair of prisms optically coupled to the diffraction grating, and

a collimator optically coupled to the at least anamorphic pair of prisms at a side opposite to the diffraction grating; and

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an output device optically coupled to the collimator at a side opposite to the at least one anamorphic pair of prisms for receiving a multi-channel light, wherein the multi-channel light comprises the plurality of channels.

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19. The system of claim 18, wherein the plurality of channels each comprises an anamorphic cross-section.

20. The system of claim 19, wherein the multi-channel light is converted by the at least one anamorphic pair of prisms such that the multi-channel light comprises a circular cross-section.

21. A system, comprising:

at least one input device for providing a plurality of channels;

an optical device, comprising:

a collimator optically coupled to the at least one input device,

at least one anamorphic pair of prisms optically coupled to the collimator at a side opposite to the at least one input device,

a diffraction grating optically coupled to the at least one anamorphic pair of prisms at a side opposite to the collimator,

a focusing lens optically coupled to the diffraction grating, and

a micro-mirror array optically coupled to the focusing lens at a side opposite to the diffraction grating, wherein each mirror in the array reflects at least one of the plurality of channels at a particular angle, wherein a tilt of each mirror in the array may be adjusted independently of the other mirrors in the array; and

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an output device optically coupled to the collimator at a side opposite to the at least one anamorphic pair of prisms for receiving a multi-channel light comprising the plurality of channels.

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22. The system of claim 21, wherein the plurality of channels each comprises a circular cross-section.

23. The system of claim 22, wherein each of the plurality of channels is converted by the at least one anamorphic pair of prisms such that the plurality of channels each comprises an anamorphic cross-section.

24. A system, comprising:

an input device for providing a multi-channel light;

an optical device, comprising:

a collimator optically coupled to the input device,

at least one anamorphic pair of prisms optically coupled to the collimator at a side opposite to the input device,

a diffraction grating optically coupled to the at least one anamorphic pair of prisms at a side opposite to the collimator,

a focusing lens optically coupled to the diffraction grating, and

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a micro-mirror array optically coupled to the focusing lens at a side opposite to the diffraction grating, wherein each mirror in the array reflects at least one channel of the multi-channel light at a particular angle, wherein a tilt of each mirror in the array may be adjusted independently of the other mirrors in the array; and

at least one output device optically coupled to the collimator at a side opposite to the at least one anamorphic pair of prisms for receiving at least one channel of the multi-channel light.

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25. The system of claim 24, wherein the multi-channel light comprises a circular cross-section.

26. The system of claim 25, wherein the multi-channel light is converted by the at least one anamorphic pair of prisms such that the multi-channel light comprises an anamorphic cross-section.

27. A method for demultiplexing a multi-channel light, the multi-channel light comprising a circular cross-section, comprising the steps of:

(a) converting the multi-channel light such that the multi-channel light comprises an anamorphic cross-section;

(b) spatially dispersing a plurality of channels of the multi-channel light; and

(c) outputting the spatially dispersed plurality of channels.

28. The method of claim 27, wherein the spatially dispersing step (b) comprises the steps of:

(b1) diffracting the multi-channel light by a diffraction grating;

(b2) reflecting the plurality of channels by a micro-mirror array, wherein each mirror in the array reflects at least one of the plurality of channels at a particular angle, wherein a tilt of each mirror in the array may be adjusted independently of the other mirrors in the array; and

(b3) condensing cross-sections of the reflected plurality of channels.

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29. A method for multiplexing a plurality of channels, each of the plurality of channels comprising an anamorphic cross-section, comprising the steps of:

(a) combining the plurality of channels into a multi-channel light;

(b) converting the multi-channel light such that the multi-channel light comprises a circular cross-section; and

(c) outputting the multi-channel light.

30. The method of claim 29, wherein the combining step (a) comprises the steps of:

(b1) reflecting the plurality of channels by a micro-mirror array at a particular angle, wherein a tilt of each mirror in the array may be adjusted independently of the other mirrors in the array; and

(b2) diffracting the plurality of channels by a diffraction grating.

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